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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/754,264	01/05/2001	Tetsuo Usami	OKI.202	3022

20987 7590 04/19/2005

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EXAMINER

RAO, SHRINIVAS H

ART UNIT PAPER NUMBER

2814

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/754,264

Applicant(s)

USAMI ET AL.

Examiner

Steven H. Rao

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-15, 17, 18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 10-15, 17, 18 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers filed on January 27, 2005 which have been entered and forwarded to the examiner on February 09, 2005, claiming priority from U.S. Serial No. 09/754,264 which itself claims priority from Japanese Patent Application No. 117990/2000 filed on April 19, 2000, which papers have been made of record in the file.

### ***Election/Restrictions***

The listing of the claims in pages 3 to 5 of the amendment states claims 1-9 as withdrawn. However the preliminary amendment filed/ faxed on January 23, 2003 cancelled claims 1 to 9..

Therefore the Application currently does not contain claims 1-9.

Applicants' must acknowledge that claims 1-9 have been cancelled and not include these claims in future amendments.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 10 -15 , 17,18 and 20 are rejected under 35 U.S.C. 103(a) as being patentable over Wang ( U.S. Patent No. 5,604,155, herein after Wang) in view of Fukui Soichi ( Japanese Patent Publication No. 9-249966, herein after Soichi) both previously applied. For response to Applicants' arguments see section below.

With respect to claim 10, Wang describes a method of depositing a wiring film over a semiconductor substrate , the method comprising :

Wang does not specifically describe a  $\text{Al}_3\text{Ti}$  target

However Soichi in its table 2 , no. 2 describes using  $\text{Al}_3\text{Ti}$  target to improve the reliability of the membrane( thin film ) formed that can be used in optical media devices.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Soichi's  $\text{Al}_3\text{Ti}$  target in Wang's method to improve the reliability of the membrane( thin film ) formed that can be used in optical media devices. ( Soichi Effect of the invention section and table 3).

The other limitations of claim 10 are :

providing a substrate (Wang col. 1 line 29 ), forming a Ti Layer over the substrate(Wang fig. 2 # 52, col. 4 lines 3-7), sputter depositing an  $\text{Al}_3\text{Ti}$  layer on said Ti layer using said  $\text{Al}_3\text{Ti}$  target ( Soichi English –abstract) and after the sputter depositing, annealing said substrate at a temperature of at least  $400^\circ\text{C}$  to promote absorption of Si into said  $\text{Al}_3\text{Ti}$  layer. (Wang fig.3 # 108, col. 4 lines 25-26, col. 3 lines 5-6 ).

The newly added limitation of performing the annealing step after sputter deposition was previously recited in claim 14 and previously rejected for Wang does not teach/describe the step of “ pattern etching an Al layer, which forms beneath said Al-Si-

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Cu layer and after depositing of the Al-Si-Cu layer, annealing the substrate at a temperature of at least 400<sup>0</sup> C" is not persuasive because Wang col. 2 lines 36-37 describe the annealing step at 450<sup>0</sup> C but not in the order presently recited in the claims.

However, as stated before, it is well settled law that , " As a matter of fact selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. In re Burhaus, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) Further , " generally , Applicants' reversed order of process sequence as compared to Wang's , can not be considered as a an act of invention, since reversing the order of prior art process step is held to render prima facie obvious. Ex parte Rubin, 126 USPQ 440 ( BAPI 1959).

It is further noted that the specification contains no disclosure of either the critical nature of claimed sequence of process steps or any unexpected results therefrom. Where patentability is said to be based upon particular chosen sequence, the Applicant must show the chosen sequence of performing steps are critical.

With respect to claim 11, wherein an Al layer is deposited on said Al<sub>3</sub>Ti layer (Wang fig. 3, col. 4 lines 25-26).

With respect to claim 12, wherein the step of pattern-etching said Al layer thereby forming a wiring pattern. (Wang col. 2 lines 52-55).

With respect to claim 13, wherein the method further comprises forming an insulating layer between said substrate and said Al<sub>3</sub>Ti layer (Wang col. 1 lines 36-38).

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With respect to claim 14, Wang describes a method of depositing a wiring film, the method comprising :

Providing a substrate ( Wang col. 1 line 29) , forming a Ti Layer over the substrate(Wang fig. 2 # 52, col. 4 lines 3-7), depositing an AlSiCu layer on said Ti layer which forms an Al<sub>3</sub>Ti layer on said Ti Layer ( Soichi English –abstract- the motivation to combine Wang and Soichi is given above ) and pattern etching an AL layer which forms beneath said ALSICU layer . annealing the the substrate at a temperature of at elast 400 C ( Wang fig. 3 step 114, Wang figure 2 step 108).

With respect to claim 15, Wang describes the method as recited in claim 14, wherein said AlSi CU layer is deposited at a temperature of at least 400 degrees C. (Wang fig.3 # 108, col. 4 lines 25-26, col. 3 lines 5-6 ).

With respect to claim 17 it repeats the steps of claim 10 and is rejected for reasons set out under claim 10 above.

With respect to claim 18, Wang teaches a method as recited in claim 17, wherein said AL layer is deposited at a temperature of at least 400<sup>0</sup> C (Wang fig.3 # 108, col. 4 lines 25-26, col. 3 lines 5-6 ).

With respect to claim 20 Wang describes a method as recited in claim 17, wherein said Al<sub>3</sub>Ti layer is deposited at a temperature of at least 400<sup>0</sup> C. ( Wanf col. 4 lines 21 to 40).

**Response to Arguments**

11/01/2004  
Applicant's arguments filed 5/14/2004, have been fully considered but they are

not persuasive for the following reasons :

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Applicants' first contention that the rejection based on Soichi is improper is wholly incorrect for the following reasons :

1) The Soichi reference was first applied in a rejection mailed on April 07, 2003 ( pages 4-5), wherein Soichi was cited quoting Table 2 no.2 as showing the use of  $\text{Al}_3\text{Ti}$  target .

.A response by Applicants' to the rejection mailed on April 07, 2003 accepting the citation of Soichi was received by the USPTO on August 07, 2003 wherein the issue of the Soichi reference Table 2 no. 2 being in the full-text of the document instead of the abstract was not raised and Applicants' were able to fully understand the rejection and respond to the rejection based on the combined teachings of Wang and Soichi containing the same citation ( table 2 , no.2) as seen from Applicants' response of August 07, 2003 at least pages 7-8 .

Based on the above Applicants' above acceptance of the Soichi full-text citation ( table 2 no. 2) a rejection was mailed out on November 19, 2003.

It is not understood , how Applicants' Applicants' have suddenly developed language problems for the Applied Soichi reference after Applicants' acceptance and prosecution proceeding upon Applicants' acceptance.

2) It is noted that Soichi table 2 no.2 describing ( $\text{Al}_3\text{Ti}$ ) is in English Language ( reproduced below) :

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種 別		原料成分の配合組成 (モル%)				ターゲットのIMC濃度 (モル%)、 (底層: Al 5%より不可正々地)		IMCの濃度均足  (モル%/mm)
		表 面 層		裏 面 層				
		IMC粉末	Al粉末	IMC粉末	Al粉末	表 面	裏 面	
本 発 明 タ ブ レ ッ ト	1	Al <sub>3</sub> Ta: 6.0	残	Al <sub>3</sub> Ta: 4.80	残	Al <sub>3</sub> Ta: 6.0	Al <sub>3</sub> Ta: 4.80	0.20
	2	Al <sub>3</sub> Ti: 8.0	残	Al <sub>3</sub> Ti: 6.40	残	Al <sub>3</sub> Ti: 8.0	Al <sub>3</sub> Ti: 6.40	0.27
	3	Al <sub>3</sub> Zr: 4.0	残	Al <sub>3</sub> Zr: 3.04	残	Al <sub>3</sub> Zr: 4.0	Al <sub>3</sub> Zr: 3.04	0.16
	4	Al <sub>3</sub> Hf: 2.0	残	Al <sub>3</sub> Hf: 1.52	残	Al <sub>3</sub> Hf: 2.0	Al <sub>3</sub> Hf: 1.52	0.06
	5	Al <sub>3</sub> Nb: 4.0	残	Al <sub>3</sub> Nb: 3.04	残	Al <sub>3</sub> Nb: 4.0	Al <sub>3</sub> Nb: 3.04	0.16
	6	Al <sub>4</sub> Cr: 10.0	残	Al <sub>4</sub> Cr: 7.90	残	Al <sub>4</sub> Cr: 10.0	Al <sub>4</sub> Cr: 7.90	0.35
	7	Al <sub>4</sub> W: 15.0	残	Al <sub>4</sub> W: 10.50	残	Al <sub>4</sub> W: 15.0	Al <sub>4</sub> W: 10.50	0.75
	8	Al <sub>4</sub> Mo: 20.0	残	Al <sub>4</sub> Mo: 12.50	残	Al <sub>4</sub> Mo: 20.0	Al <sub>4</sub> Mo: 12.50	1.25
	9	Al <sub>3</sub> Ta <sub>2</sub> : 12.5	残	Al <sub>3</sub> Ta <sub>2</sub> : 11.00	残	Al <sub>3</sub> Ta <sub>2</sub> : 12.5	Al <sub>3</sub> Ta <sub>2</sub> : 11.00	0.25
	10	Al <sub>3</sub> Ta: 2.0	残	Al <sub>3</sub> Ta: 1.88	残	Al <sub>3</sub> Ta: 2.0	Al <sub>3</sub> Ta: 1.88	0.02

3) It is noted that the Applicants' herein are Tesuo Usami and Yoshikawa Arakawa are both native Japanese language speakers and can easily read and understand the entire Soichi reference in Japanese language and further the deceleration herein is also in Japanese.

4) Therefore Soichi is properly applied as a reference.

Applicants' second argument with respect to claims 10 that Wang does not teach/describe the step of "pattern etching an Al layer, which forms beneath said Al-Si-Cu layer and after depositing of the Al-Si-Cu layer, annealing the substrate at a temperature of at least 400<sup>0</sup> C" is not persuasive because Wang col. 2 lines 36-37



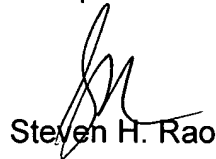
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describe the annealing step at 450 ° C but not in the order presently recited in the claims.

However, as stated before, it is well settled law that , “ As a matter of fact selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. In re Burhaus, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) Further , “ generally , Applicants’ reversed order of process sequence as compared to Wang’s , can not be considered as a an act of invention, since reversing the order of prior art process step is held to render prima facie obvious. Ex parte Rubin, 126 USPQ 440 ( BAPI 1959).

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Steven H. Rao whose telephone number is (703) 306-5584. The examiner can normally be reached on Monday- Friday from approximately 7:00 a.m. to 5:30 p.m.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. The Group facsimile number is (703) 308-7724.



Steven H. Rao

Patent Examiner

April 16, 2005.